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GROWING CORN



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This publication contains general information on how to grow corn. To give specific recommendations for every locality in Canada where corn can be grown would be impractical, and besides, the continuous advances in breeding, nutrition, and control of weeds and insects would soon make many of the recommendations obsolete. Therefore, for detailed recommendations on hybrids, crop production practices, and other related matters, refer to provincial and Canada Department of Agriculture extension publications and press releases, and consult the advisory services offered by the experimental farms and agricultural representatives.

10 STEPS TO SUCCESS

- ▶ Choose your hybrid carefully. More than 150 hybrids are licensed for sale in Canada, but only one or two of these might be suitable for you.
- ▶ Plant early. Corn needs every day of the growing season to produce maximum yield.
- ▶ Plant at the recommended rate. Both underplanting and overplanting are wasteful of productive capacity.
- ▶ Corn needs a high level of fertility. Be sure to supply it. The results will be worth the expense.
- ▶ Corn grows best on well-drained, warm soil, particularly in the early stages of growth. Poorly drained soil is cold.
- ▶ Do not let weeds rob the corn crop of soil moisture and fertility. Even a few weeds can reduce your yield. You can not afford not to use one of the effective and economic herbicides that are available.
- ▶ Learn to recognize the important diseases and insect pests of corn, and find out how to deal with them.
- ▶ Harvest your corn at the right time. If the crop is for grain, start harvesting it as soon as it is mature. The longer you leave the crop standing, the more stalks will break and the more ears will be missed at harvest. If the crop is for silage, put it in the silo before the first frost. Frozen corn has lost part of its nutritive value.
- ▶ Store your corn in the right condition in well-constructed cribs, bins, or silos.
- ▶ Few crops are as sensitive as corn is to management practices, but the rewards for careful attention to sound management are great.

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GROWING CORN

L. S. Donovan,¹ C. G. Mortimore,² and J. E. Giesbrecht³

Corn is increasing in importance in Canada. The crop is steadily expanding into new areas. From 1966 to 1972 the acreage in corn has almost doubled. Of 2,200,000 acres (900,000 ha) now being grown, about 60% is for grain and 40% for silage. About 88% of the grain acreage and 80% of the silage acreage is grown in Ontario.

Research on all aspects of growing corn has contributed to the increase. Plant breeders have developed improved hybrids. Better fertilization practices have increased yields. Improvements in farm machinery have increased the number of acres a grower can handle without extra help. Effective, inexpensive herbicides have greatly reduced the need for inter-row cultivation. As further progress is made, the grain acreage will probably continue to increase.

The acreage of silage corn is also expected to increase. Corn is becoming more important as a silage crop in some Western and Atlantic provinces. In Ontario and Quebec acreage will continue to increase, but at a slower rate than in recent years.

¹Research Station, Ottawa, Ont.

²Research Station, Harrow, Ont.

³Research Station, Morden, Man.

HYBRID CORN

Hybrids rapidly replaced open-pollinated varieties after their introduction into Canada in 1937. The higher yields resulting from hybrid vigor and the superior plant characteristics that were bred into the hybrids mark great advances in corn breeding. By this method of breeding, inbred lines having desired characters are developed and combined in various ways by cross-pollination. The three most common types of hybrids are the single, the three-way, and the double cross. These are crosses between two inbred lines, between one inbred and a single cross, and between two single crosses. Double crosses were formerly the most important commercial type, but now the three-way and the single cross hybrids are more popular.

SELECTING A HYBRID

Many hybrids are sold in Canada but only a few may be adapted to a particular region. Recommendations on the best hybrids to grow are based on tests conducted at various locations. Regional corn committees coordinate these tests in their respective areas. Recommendations are published annually and they are available on request from the federal and provincial departments of agriculture.

FOR GRAIN

The main characteristics to consider when you are selecting a hybrid to be grown for grain are maturity, yield, and stalk breakage. The hybrid should reach maturity every year before the first frost occurs (Fig. 1). When grain moisture reaches 35%, growth is nearly finished and the quality or yield of grain is not affected by the usually light first frost. Frozen, immature corn is of inferior quality: the ears do not crib well, the yields are lower than mature corn, and when combined, the percentage of broken kernels is higher. However, a hybrid that matures too early for a locality usually yields less because it does not make full use of the growing season.

Stalk breakage is important because the picker often misses ears on broken plants and the result is a lower yield. Most of the stalk breakage is caused by stalk rot, a disease that develops as the crop matures.

Resistance of a hybrid to other diseases (such as leaf blight and smut) and insects (such as the European corn borer and aphids) must also be considered when the crop is to be grown in areas where one or more of these problems occur.

Since none of the hybrids excel in all of the desired characteristics, you still have to use your judgment in making your



Fig. 1. A well-chosen hybrid with strong stalks and uniformly matured ears.

selection. If you are planning to start growing corn, choose two or three hybrids on the basis of test information and grow them to find out which one is best for you. If you regularly grow corn and have established preferences, review your selections every year, because new hybrids are continually coming on the market.

FOR SILAGE

Maturity and yield are the two main considerations when you are choosing a hybrid for silage. Stalk breakage is not as important because the crop is harvested before much breakage occurs.

Choose a hybrid that is a few days later than the one you would grow for grain. The best corn silage is made when the grain is in the late-dough stage, which is when the kernels are well dented. At this stage, moisture in the whole plant should be between 65 and 70%. The best-yielding hybrid that

regularly reaches this stage before frost is the one to grow. A hybrid that gives a high grain yield also usually gives a high silage yield.

CORN IN THE ROTATION

Corn can be grown successfully any place in the rotation or continuously in the same field, provided proper management practices are followed.

SOILS AND FERTILIZERS

Corn grows well on a fairly wide range of soils, but does best on well-drained, deep, fertile loams. On fine-textured soils, such as clay loams and clays, good drainage is important. If the natural drainage is poor, a system of tile or surface drains is needed. Properly fertilized sandy soils produce good crops.

Corn needs a high level of fertility to produce a good yield. A corn crop yielding 100 bu of grain/ac takes about 150 lb of nitrogen, 70 lb of phosphoric acid, and 120 lb of potash from the soil (or for 90 hl of grain/ha, about 168 kg of nitrogen, 78 kg of phosphoric acid, and 134 kg of potash). Corn also uses up small amounts of calcium, magnesium, sulfur, and other elements.

Severe deficiencies of the main nutrients are shown by distinctive symptoms in the plants. Nitrogen starvation is indicated by the yellowing of all leaves, and the drying up or "firing" of the lower leaves. However, several applications of nitrogen at a high rate on soils in Eastern Canada may increase soil acidity, which in combination with prolonged periods of cool temperatures in the spring can result in pale and stunted growth. It is important to maintain the pH of these soils at or above 6.0 by applying limestone. A deficiency of phosphorous causes plants to grow slowly and mature late, and under severe conditions, the leaves of young plants are purplish. Insufficient potash is indicated when the margins of the lower leaves turn yellow and die.

The correct amount and analysis of fertilizer to use depend on the fertility of the soil, former crops, soil temperature, and moisture supply. Even on the most fertile soils, corn nearly always responds to applications of additional fertilizer, particularly nitrogen. In a cold, wet spring, commercial fertilizers can provide the required nutrients in a readily available form to give the crop a good start. For the greatest benefit from fertilizer, the soil must be moist enough to make the nutrients available to the crop.

The best way to find out the amount and analysis of the

fertilizer you should use is to have your soil tested. If it is impossible to have the soil tested, follow the recommendations of your provincial fertilizer board or local experimental farm.

Fertilizer for the corn crop may be plowed down, or broadcast and worked into the soil, or applied in a band to the side and below the seed at planting. Where high rates of fertilizer are needed, apply only part of the fertilizer in a band. Usually more nitrogen is needed than can be obtained economically through complete fertilizers. To meet this need, broadcast a nitrogen fertilizer before planting or place it deep in the soil between the rows with the use of an applicator after planting.

PREPARING THE SEEDBED

A firm seedbed of good tilth is very important. It holds the moisture near the surface so that the corn may be seeded quite shallow, preferably 1½-2 in. (4-5 cm) deep. Shallow planting is recommended in early May, when temperatures are low. Under these conditions, shallow planting permits faster germination and provides better stands because the soil temperatures are higher near the surface of the ground.

FALL TILLAGE

For heavy soils or sod on light soils, fall plowing is usually best. Light, sandy soils may be worked with a one-way disc. If fall plowing or disking is done early enough, many weeds start to grow and are killed later by frost. Plowing the residues from the previous crop adds organic matter and improves the texture of the soil. Plowing down well-rotted manure is also an excellent practice. On fall-plowed land, it is best to delay all spring tillage until just before planting to conserve moisture and provide a more mellow seedbed. Till only enough to obtain the desired seedbed.

SPRING TILLAGE

Light, sandy soils are usually plowed in the spring as soon as the land is dry enough. It is best to pull a packer behind the plow or disc, particularly if there is a heavy straw cover on the field. Heavy soils plowed in the spring often result in a loose, lumpy seedbed, which dries out quickly and leads to uneven germination.

SEED TREATMENT

Seed that has been treated with a fungicide survives poor germinating conditions better than untreated seed. All seed corn is treated before it is sold. Further treatment with recommended insecticides just before planting will control seedcorn maggots and wireworms.

TIME AND DEPTH OF SEEDING

Plant as early in May as soil conditions are suitable for the necessary tillage operations. The earliest plantings provide the highest yields, and mature the earliest. For best emergence, early plantings should not be seeded deeper than 2 in. (5 cm). Later plantings may be as deep as 3½ in. (9 cm), if required, in order to place the seed in moist soil. Although corn seed will not germinate at temperatures below 50° F (10° C), fungicide-treated seed can be planted before the soil has reached germinating temperatures without any harmful effects. Young seedlings can be frozen with little, if any, damage to the crop, but older seedlings where the growing point has moved above the surface of the soil may be permanently damaged by frost. Fortunately, heavy frosts rarely occur after this stage of growth has been reached.

RATE OF SEEDING

Well-fertilized soils with good moisture-holding capacity can support more plants than droughty, less fertile soils. With a high rate of fertilization on good soils, a stand of 18,000-22,000 plants/ac (44,500-54,400 plants/ha) is best for both grain and silage. On droughty, less productive soils, plant populations should be reduced. Reductions up to 20% may be necessary to prevent barren plants and poor ear development.

Because the size of seed can vary with the hybrid and the year of production, the best way to obtain the desired stand is to calibrate the planter by using the seed to be sown and driving the tractor at the speed that will be used. The table that follows will help you to do this. The figures in the table are based on the estimate that about 10% of the seeds planted will not produce mature plants. Yield is not usually affected by row spacings in any of these stands. Plant at a slow speed 3-4 mph (5-6 km/hr) for accurate and uniform seeding. The table lists the number of seeds per 100 ft

(30 m) for three desirable plant populations in five row spacings.

Row spacing, in. (cm)	18,000 plants/ac (44,500 plants/ha)	20,000 plants/ac (49,500 plants/ha)	22,000 plants/ac (54,400 plants/ha)
	No. of seeds per 100 ft (30 m)		
30 (76)	114	126	139
32 (81)	121	135	148
34 (86)	129	143	157
36 (91)	136	152	167
38 (96)	144	160	176

CONTROLLING
WEEDS

CULTURAL METHODS

The most effective implements for destroying young weeds are the rotary hoe and the finger weeder. They can be used until the corn is about 6 in. (15 cm) high (leaf extended). For best results, use them when the weed seeds are germinating and the weeds look like white threads just below the surface of the soil. These implements provide a fast, effective way of destroying small weeds and breaking up crusted soil after a heavy rain. Be sure to keep them free of trash. After the corn emerges, it is best to use these implements on a bright, warm day when the crop is slightly wilted and less likely to be injured. The spike-tooth harrow may also be used, but it is less satisfactory.

When the corn is over 5 or 6 in. (13-15 cm) high, use the row cultivator to cultivate 2 or 3 in. (5-8 cm) deep, fairly close to the plants. However, as growth continues the roots spread out rapidly and cultivating should be shallower and farther from the plants so that you do not cut off too many roots. Cultivate as often as needed to destroy weeds. Cultivation is not recommended after the plants are over 2½ ft (0.8 m) high.

CHEMICAL METHODS

In recent years several chemicals have become available that are commonly used, either alone or in mixtures, to control



Fig. 2. Control of weeds with a herbicide (the strip in the middle was not sprayed).

weeds in corn. But because changes are being made continually in chemicals and in their time and method of application, and some chemicals are more effective in certain localities than others, it is impractical to make recommendations on the use of herbicides in this publication. For the most up-to-date information, consult the annual publication of your provincial weed committee, available from your local agricultural representative.

Usually the best control of weeds in corn is obtained by using herbicides (Fig. 2) in conjunction with certain cultural practices. Because the most effective program varies from farm to farm, you will have to select the combination most suitable for your needs.

DISEASES

Some of the most common diseases that attack corn in Canada are described here.

DAMPING-OFF AND SEEDLING BLIGHTS are not as common

as they used to be, because all hybrid corn seed is treated with a fungicide to control the soil-borne organisms that cause these diseases.

SMUT AND RUST may occur sporadically, but the modern hybrids are resistant enough to prevent serious epidemics. Corn smut appears first as white galls that later turn black; these galls can develop anywhere on the plants. Rust appears on the leaves in the summer as reddish pustules that change to black as the corn matures.

STALK ROT is a serious problem in most areas where corn is grown for grain. The disease weakens the stalks of maturing plants by attacking the roots and pith of the lower internodes of the stalks, which become rotted or shredded and often pinkish in color. These stalks break easily (Fig. 3). Stalk breakage is most serious in fields where plants are exposed to undue stresses such as high plant populations, low fertility, drought or excessive moisture, leaf blights, and insect damage. Stalk rot affects only mature plants, so it is wise to harvest your crop as early as possible because breakage



Fig. 3. Plants infected with stalk rot.

increases the longer the corn is left in the field. Some hybrids are available that are more resistant to stalk rot than others. Grow hybrids with low incidence of stalk breakage that are listed in the provincial Hybrid Corn Performance Trial reports.

NORTHERN CORN LEAF BLIGHT (Fig. 4) is recognizable by the large, elliptical, grayish green or tan spots on the leaves in August and September. The disease is favored by warm, wet weather and prolonged periods of heavy dew. This blight does not usually overwinter to any extent in Canada. However, outbreaks have occurred when the weather particularly favored the disease. If northern leaf blight becomes established soon after silking, yields can be substantially reduced. A spray program should be considered. Resistant hybrids are available.



Fig. 4. Leaves infected with northern leaf blight.



Fig. 5. A leaf infected with southern leaf blight.

SOUTHERN CORN LEAF BLIGHT (Fig. 5) occurred for the first time in the central corn belt of the United States and in Ontario in 1970. The spread of this blight to the northern areas resulted from the occurrence of a new race (T), which could attack hybrids having Texas cytoplasmic male sterility and could survive the northern winters. The disease is favored by warm, wet weather and prolonged periods of heavy dew. The spots of southern leaf blight are small, $\frac{1}{2}$ -1 in. (13-25 mm) long, and up to $\frac{1}{4}$ in. (6 mm) wide. Hybrids with normal cytoplasm are resistant to this race of southern leaf blight.

YELLOW LEAF BLIGHT is another disease that has caused some losses in Ontario in recent years. Spots of this blight are similar to those of southern leaf blight. Hybrids with normal

cytoplasm are highly resistant to both yellow and southern leaf blights.

EYE SPOT consists of very small, circular lesions up to 1/16 in. (1.6 mm) in diameter with a dark brown margin. This late-season blight has not been a problem in Canada.

EAR ROTS may be a serious problem in seasons when maturity is greatly delayed and ears dry slowly because of prolonged cool, wet weather between August and harvest. Ear rot develops after one or more molds have invaded the kernels and cobs. There are several symptoms, which vary depending on the organism involved: white, pink, or gray molds on the surface of the kernels; easily broken cobs; and chaffy grain. Damage to the tips of the ears caused by birds provides an opening for infection to enter. When corn infected with certain molds is fed in quantity, it can cause sickness in livestock and poultry.

Corn that is too high in moisture content at the time of cribbing may rot in storage.

INSECT PESTS

Corn may be damaged by several insect pests such as the European corn borer, the northern corn rootworm, aphids, the seedcorn maggot, wireworms, cutworms, the corn earworm, the armyworm, and grasshoppers. The species of insects and their importance vary with the district and the year. Familiarize yourself with the pests likely to occur in your locality and find out how to control them. The following publications contain descriptions of the insects and the methods of controlling them:

COMMON INSECTS OF CORN IN EASTERN CANADA by H. B. Wressell, Canada Department of Agriculture, Publication 945. Revised 1968.

CONTROL OF THE CORN EARWORM by D. D. Pond, Canada Department of Agriculture, Publication 1304. 1966.

FIELD CROP RECOMMENDATIONS FOR ONTARIO, Ontario Ministry of Agriculture and Food. Published annually.

HARVESTING AND STORING

GRAIN

There are two methods of harvesting corn for grain and four principal ways of storing it. The most common method of harvesting corn is with the use of a standard grain combine fitted with a corn head. Corn heads come in two-, three-, or four-row units, which on the newer machines are adjustable

for different row spacings. For best results, grain moisture should not exceed 30% at harvest. The grain may then be dried artificially to 13-14% moisture, stored as high-moisture corn in an airtight silo, or treated with an organic acid preservative and placed in any suitable open storage. When the corn is dried with an oil heater, be careful to prevent it from taking on an oily odor, particularly if it is going to be sold for industrial use. Gas-fired dryers are recommended.

If high-moisture corn is stored in a silo, it is particularly important for the silo to be airtight. However, high-moisture corn treated with an organic acid preservative does not have to be stored in a silo but can be stored in less expensive structures. By this method, acid is applied thoroughly and evenly to the grain at the recommended concentration. Corn stored by these two methods can only be used for on-the-farm feeding of livestock.

Although the percentage of corn harvested with a mechanical picker and stored in cribs is decreasing, it is still an efficient and economical way of handling the crop. The mechanical picker does an excellent job if it is operated properly. Watch the adjustment to see that it is doing a good job of husking and not causing too much shelling. Drive at a moderate speed. If you drive too fast, or if the picker is not properly adjusted, you will lose corn from shelling and dropped ears. The ears should not have any husk attached after going through the picker. Husks on the ears slow down the drying in the crib and may cause spoilage.

In areas having more than 3,000 heat units, grain moisture should be down to 25% before the crop is picked and cribbed. In areas having fewer than 3,000 heat units, corn may be safely cribbed at progressively higher levels of grain moisture provided the ears are husked clean and the cribs are properly built.

There are two main types of corn cribs: permanent (Fig. 6) and temporary (Fig. 7). Plans of corn cribs and silos, prepared by the Canadian Farm Building Plans Service, are available from provincial departments of agriculture.

Permanent cribs are sturdily built, 7-10 ft (2-3 m) high, 4-5 ft (1-1.5 m) wide, and any suitable length.

Temporary cribs are made of snow fencing, placed in a circle, as shown in Fig. 7. This crib consists of two rings or layers of snow fence, 6 or 7 ft (2 m) in diameter, set on a raised platform to prevent damage from runoff water. When the first ring is almost filled, the second ring is inserted telescope fashion, so that it just fits inside the bottom ring. Although these cribs are often left uncovered, it is better to cover them with straw.

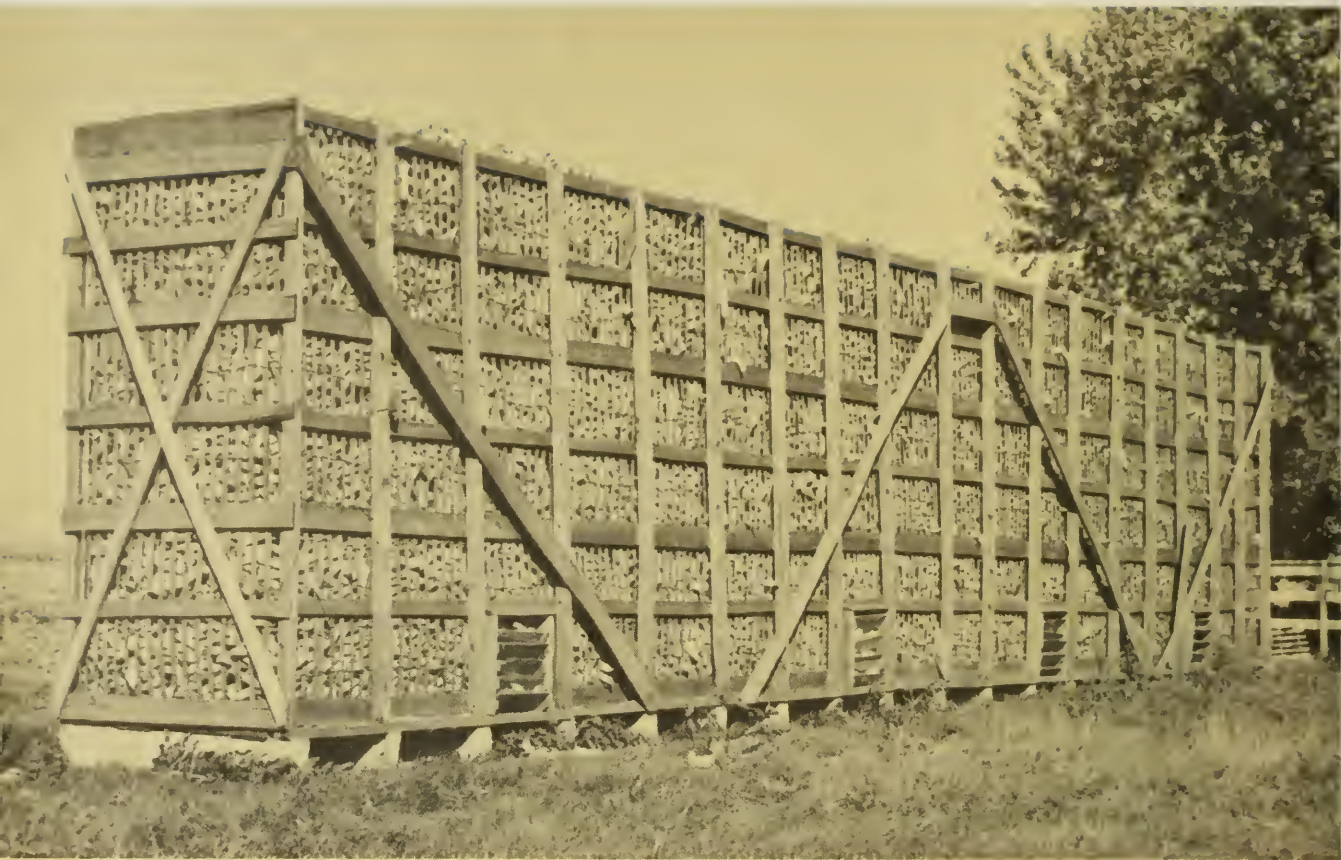


Fig. 6. Two types of permanent corn crib.



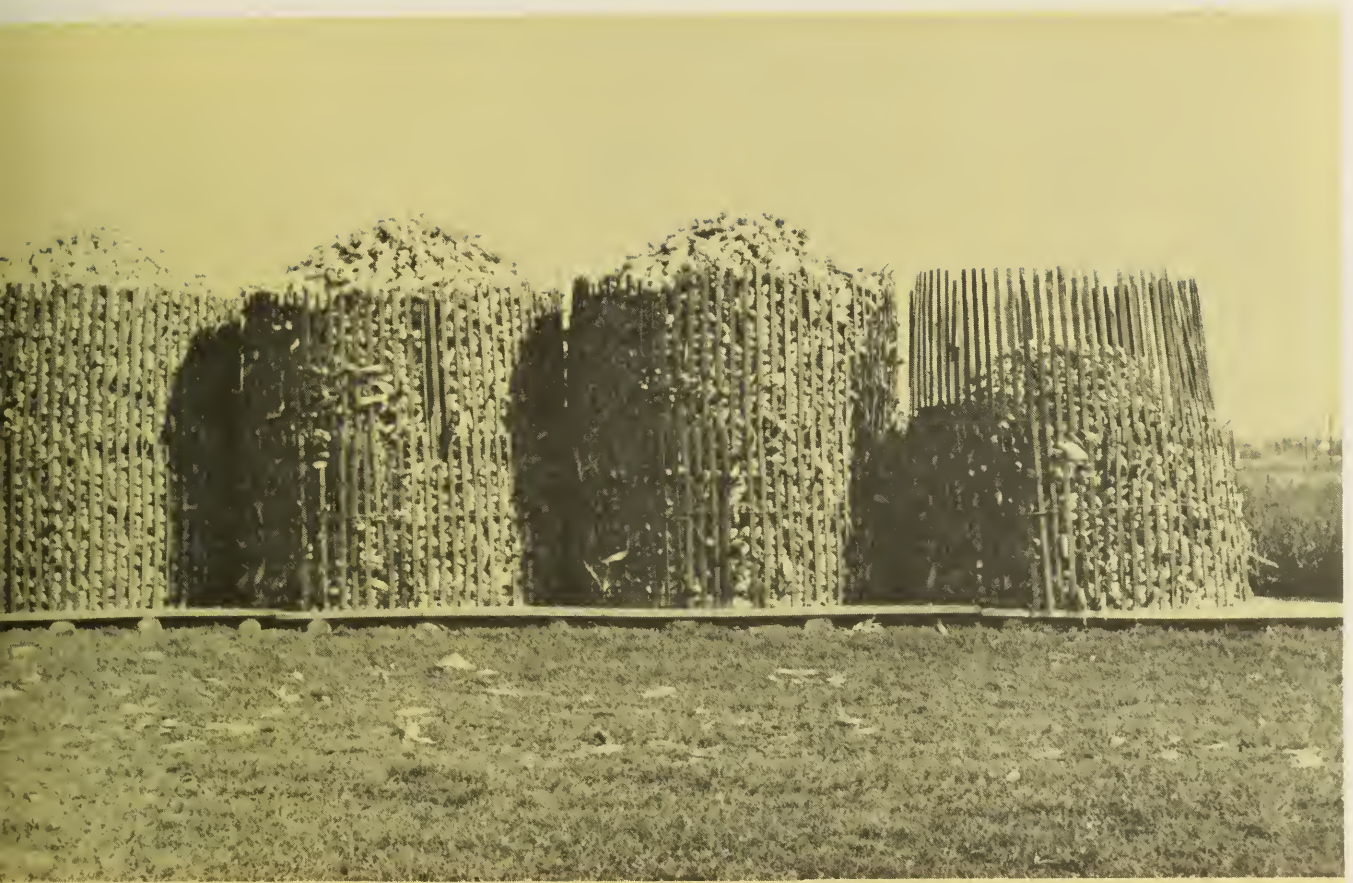


Fig. 7. A temporary corn crib.

SILAGE

Most corn silage is made from the whole plant, which is cut into small pieces and put in tower or bunker silos, or, in some areas where temperature and precipitation are suitable, by packing the silage in piles on the ground. Bunkers or piles should be covered with hay, straw, or plastic sheets.

A properly chosen hybrid in an average season should be ready to harvest at least a week before the first frost is expected. At this stage, most of the kernels are well dented and the whole plant contains about 65-70% moisture. Sometimes it is better to harvest the crop before this stage. Ensile earlier if late-season drought causes the plants to lose moisture prematurely, or if an unfavorable growing season has delayed maturity and frost threatens. If possible, do not let the crop freeze, because frosted corn loses almost all its carotene, is harder to ensile properly, and may be less palatable and digestible.

For best results in making silage:

- ▶ Cut the corn into small pieces. Smaller pieces pack more closely.

- ▶ Ensile the crop as soon as possible after cutting to avoid wilting.
- ▶ Add water if the crop is dry or frosted. Dry material does not contain enough water for proper packing or satisfactory fermentation.

Varying amounts of carbon dioxide and nitrogen dioxide are given off by fermenting silage. Both of these gases are toxic if breathed in sufficient concentration for long enough. Carbon dioxide is an odorless and colorless gas. Nitrogen dioxide, if present in high enough concentration, is yellowish and irritating to breathe.

The most danger from these gases occurs when a tower silo is being filled. ***Before you enter a partly filled silo, turn on the blower for a few minutes to dispel any pockets of these heavier-than-air gases. Leave the blower turned on as long as anyone is in the silo. While the silage is fermenting, keep children and animals away from the silo.*** Humans and animals have been killed by the toxic gases.

Silage can also be made from the ear (grain and cob). This method has been used to salvage immature corn, which cannot be safely cribbed, and also where silo space is limited. Silage made from the ear, which is the most valuable part of the corn plant, can be stored in a smaller space than whole-plant silage. This type of silage needs an airtight silo with strong walls. Only a small percentage of corn silage is made in this way.

PRODUCING HYBRID SEED

To produce corn seed, the plantings must be isolated to maintain the purity of the variety or hybrid. Unlike other grain crops, corn is an open- or cross-pollinated plant. The pollen produced in the tassel is spread by the wind and may alight on the exposed silks of the ears of any corn plant within range, thereby fertilizing it. For regulations on isolation and other requirements for producing corn seed, see the most recent issue of Circular No. 6 of the Canadian Seed Growers' Association, or consult your local agricultural representative.

Seed corn is processed and sold commercially according to size (small, medium, and large) and shape (round and flat).

Because hybrid corn seed is produced under a system of controlled pollination where the male and the female parent of the cross are known, it is possible to reproduce exactly the same hybrid year after year. The male, or pollen parent, and the female, or seed parent, are grown alternately in the field. Single-cross seed is usually produced by alternating two



Fig. 8. A field of corn being grown for seed production: detasseled female (seed) rows alternate with male (pollen) rows.

rows of seed parent with one row of pollen parent. The most common method of producing the double-cross seed is to alternate six rows of the seed parent with two of the pollen parent (see Fig. 8). Similar methods are used to produce seed of other hybrid types. The number of rows of seed parent needed depends on the ability of the male parent to furnish enough pollen to bring about complete fertilization of the seed parent.

For many years most hybrid seed was produced by making use of male sterility in the female parent, a factor that prevents the plant from producing viable pollen. In this way, seed corn can be produced without detasseling the female parent. However, the epidemic of southern corn leaf blight in 1970 showed that the Texas type of male sterility used in seed production was responsible for the susceptibility of the hybrids to the blight. Therefore, in 1971 seed companies reverted to the use of normal cytoplasm and hand or mechanical detasseling.

To produce hybrid seed, besides keeping the stand isolated, you must detassel the seed parent at the proper time so that

all the pollen for the seed crop comes from the pollen parent. The advantages of hybrid corn are reduced by allowing even a few of the female plants to shed pollen.

**CORN
BREEDING
IN
THE
CANADA
DEPARTMENT
OF
AGRICULTURE**

Corn breeding programs have been in progress for many years at the research stations at Ottawa and Harrow in Ontario, at Morden, Manitoba, and more recently at Lethbridge, Alberta. Forty-two hybrids have been developed and released to seed companies for commercial production. Twenty-six of these were still licensed for sale in 1972; most of these hybrids appear on one or more of the regional recommended lists.

Also, many inbreds have been developed at the research stations. These inbreds are used in breeding programs by various institutions and commercial seed companies in Canada, the United States, Europe, and Asia.

**REGIONAL
CORN
COMMITTEES**

The responsibility for determining the best hybrids for the various localities in Canada where corn can be successfully grown for grain or silage, or both, falls on regional committees located in the Atlantic Provinces, Quebec, Ontario, Manitoba, Alberta, and British Columbia. The committees are made up of federal, provincial, and university representatives, farmers, and members of farm organizations and agricultural businesses. These committees sponsor field trials at several carefully chosen locations within their regions. Results of these tests and recommendations are made available to growers in lists, which, in some cases, also include performance data. The publications, published annually, that contain these lists are as follows:

FIELD CROP RECOMMENDATIONS FOR THE ATLANTIC PROVINCES

EVALUATION DES HYBRIDES DE MAIS GRAIN ET DE MAIS FOURRAGE

REPORT OF ONTARIO HYBRID CORN PERFORMANCE TRIALS

ONTARIO FIELD CROP RECOMMENDATIONS

FIELD CROP RECOMMENDATIONS FOR MANITOBA

ALBERTA CORN COMMITTEE: LIST OF RECOMMENDED HYBRIDS

CORN HYBRID RECOMMENDATIONS FOR BRITISH COLUMBIA

METRIC EQUIVALENTS

LENGTH

inch	= 2.54 cm	millimetre	= 0.039 in.
foot	= 0.3048 m	centimetre	= 0.394 in.
yard	= 0.914 m	decimetre	= 3.937 in.
mile	= 1.609 km	metre	= 3.28 ft
		kilometre	= 0.621 mile

AREA

square inch	= 6.452 cm ²	cm ²	= 0.155 sq in.
square foot	= 0.093 m ²	m ²	= 1.196 sq yd
square yard	= 0.836 m ²	km ²	= 0.386 sq mile
square mile	= 2.59 km ²	ha	= 2.471 ac
acre	= 0.405 ha		

VOLUME (DRY)

cubic inch	= 16.387 cm ³	cm ³	= 0.061 cu in.
cubic foot	= 0.028 m ³	m ³	= 31.338 cu ft
cubic yard	= 0.765 m ³	hectolitre	= 2.8 bu
bushel	= 36.368 litres	m ³	= 1.308 cu yd
board foot	= 0.0024 m ³		

VOLUME (LIQUID)

fluid ounce (Imp)	= 28.412 ml	litre	= 35.2 fluid oz
pint	= 0.568 litre	hectolitre	= 22 gal
gallon	= 4.546 litres		

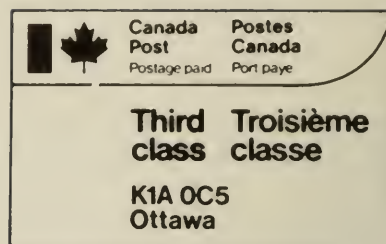
WEIGHT

ounce	= 28.349 g	gram	= 0.035 oz avdp
pound	= 453.592 g	kilogram	= 2.205 lb avdp
hundredweight (Imp)	= 45.359 kg	tonne	= 1.102 short ton
ton	= 0.907 tonne		

PROPORTION

1 gal/acre	= 11.232 litres/ha	1 litre/ha	= 14.24 fluid oz/acre
1 lb/acre	= 1.120 kg/ha	1 kg/ha	= 14.5 oz avdp/acre
1 lb/sq in.	= 0.0702 kg/cm ²	1 kg/cm ²	= 14.227 lb/sq in.
1 bu/acre	= 0.898 hl/ha	1 hl/ha	= 1.112 bu/acre

INFORMATION
Edifice Sir John Carling Building
930 Carling Avenue
Ottawa, Ontario
K1A 0C7



IF UNDELIVERED, RETURN TO SENDER

EN CAS DE NON-LIVRAISON, RETOURNER À L'EXPÉDITEUR